X-40A Space Maneuver Vehicle Successfully Completes First Flight Test

Payoff

The X-40A Space Maneuver Vehicle (SMV) was dropped from a UH-60 Blackhawk helicopter at an altitude of 9,000 feet above the ground and performed a controlled approach and landing. The total flight time was 1 minute 40 seconds and simulated the final approach and landing phases of such a vehicle returning from orbit. The 90 percent- scale SMV X-40A uses an integrated Global Positioning Satellite (GPS) with a differential system and inertial navigation system (INS) to land on the runway.

Accomplishment

The Air Force Research Laboratory's (AFRL's) Space Vehicles Directorate's (VS) X-40A (SMV), as a reusable upper stage, can be launched from several candidate booster platforms, but is currently designed as a key component of the Space Operations Vehicle (SOV) system architecture. The SOV architecture will support future military missions in space utilizing a reusable first stage and the SMV's ability to perform a variety of missions by changing its orbits prior to recovery.

Background

The Air Force is very interested in military spaceplanes and transatmospheric vehicles. As our country's economic and military resources in space continue to expand rapidly, requirements for routine, fast-response, aircraft-like operations to, in, and from space are becoming increasingly important. The SMV flew for the first time at Holloman AFB, NM, and successfully demonstrated autonomous approach and landing for a small, reusable, spacecraft upper stage that will function in low-earth orbit. It is 22-feet long, weighs 2,600 pounds and is made of graphite-epoxy and aluminum. This test was the first of its kind for a low lift/drag unmanned vehicle and it incorporated differential GPS/INS guidance and automated flare, landing, and braking. The SOV Program Office at Kirtland AFB, NM, plans to continue expansion of the SMV's flight envelope to include autonomous return from space and to evaluate technologies developed by AFRL for incorporation into the research and prototype versions of the SMV.